Risk Communication with Mid-Level Decision Makers
Challenges and Lessons Learned
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Senior Management

Commission

Executive Directors for Operations

Offices Reporting to Commission (e.g., OGC, OPA)

Office Directors (e.g., NRR, RES, Regions)
Mid-Level Decision Maker

Office Director
NRR

Division Directors
(e.g., Risk Assessments)

Branch Chiefs
(e.g., PRA Licensing, PRA Operations)
Challenges

• Select appropriate topics
  • Choose appropriate content
  • Choose level of detail
  • Select communication mechanism’s
  • Select the “messenger’s”
  • Choose “timing”
  • ?
Selecting Topics (Examples)

• Licensing – Cost\Schedule\Efficiency

• Reactor Oversight Process – Risk Significance of Findings

• **Risk-Informed Decision Making (RIDM)**

• Fire PRA Realism

• Use of Newly Developed Methods in PRAs

• Margins between QHOs and Risk Metrics

• Crediting FLEX Strategies in RIDM
Challenging Decisions (RIDM)

• How should the NRC staff communicate issues to enable RIDM?
  – How did we combine quantitative risk results with other criteria to facilitate risk informed decision making?
    • Specific concern is when quantitative risk results are near or exceed regulatory thresholds
Plant Assessment

<table>
<thead>
<tr>
<th>Inspection Findings (Risk Range)</th>
<th>Performance Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green – Very Low ((\Delta CDF &lt; 1\times10^{-6}))</td>
<td>Acceptable</td>
</tr>
<tr>
<td>White – Low to Moderate ((1\times10^{-6} \leq \Delta CDF &lt; 1\times10^{-5}))</td>
<td>Outside Normal Range</td>
</tr>
<tr>
<td>Yellow – Substantial ((1\times10^{-5} \leq \Delta CDF &lt; 1\times10^{-4}))</td>
<td>Significant Reduction in Safety Margin</td>
</tr>
<tr>
<td>RED – High ((\Delta CDF \geq 1\times10^{-4}))</td>
<td>Significantly Outside of Design Basis</td>
</tr>
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</table>
RG 1.174 and Application Specific Metrics Should Be Met

Compare PRA results to RG 1.174 or application specific acceptance criteria
Some Key Pertinent Facts

• Industry and NRC have been aggregating quantitative results since the 1970s.
• Aggregating mean values of risk metrics (CDF, LERF) attributed to initiators with varying uncertainties is mathematical correct.
• NUREG-1855 provides guidance on how to treat uncertainties.
• For purposes of risk-informed decision making numerical values associated with defining the regions in RG 1.174 are to be interpreted as indicative values only.
Lesson Learned

Clearly articulated guidance on how to consider factors such as defense-in-depth, safety margin, and performance monitoring can mitigate the decision making challenges associated with risk-informed decision making in reactor oversight, licensing, and incidence response processes.